



Assessing Your Pesticide Storage and Handling

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The goal of this *Farm•A•Syst* factsheet is to help you protect and improve the groundwater that supplies your drinking water as well as the ponds, lakes, rivers, and streams that make Tennessee beautiful.

The following questions are designed to help you pinpoint potential problem areas on your farmstead. These problem areas may contribute to the contami-

nation of your drinking water if they are not managed properly.

If your answer to any of these questions is *YES*, or if you don't know the answer, you may have a high-risk situation in your home or on your farmstead. Refer to the fact section with the same number as that question (under the heading "What you should know

YES **NO**

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Do you store more than 55 gallons or more than 550 pounds of pesticides on your property? |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Do the pesticides you use have a high leaching potential? (That is, do they move easily <i>with water</i> through the soil? See the chart on pages 7–9 for a list of herbicides and insecticides and their leaching classifications.) |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Do you use mostly liquid pesticides? |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Does your pesticide storage area have a gravel or dirt floor? |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Are the labels missing on your pesticide containers, or do the containers have holes or tears that allow chemicals to leak? |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Is your pesticide storage area accessible to thieves, vandals, children, or livestock? |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Do you mix and load pesticides on a gravel surface that allows spills to seep into the ground, such as soil or gravel, or on a surface without a curb to catch spills? |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. If you answered yes to Question 7, is this surface within ten feet downslope or 100 feet upslope of your well? |

Continued on p.2

YES **NO**

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Do you use faucets without anti-backflow devices to fill your sprayer? |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Do you leave the sprayer unsupervised while it is filling? |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. Do you hand-pour pesticides? |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. Do you wash your sprayer at the farmstead and then dump the rinsate there or in the field? |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Do you ever dispose of partially filled containers on your farm? |

about . . .”) for more information.

Don’t be alarmed if you answered *YES* to many or even all of these questions. That does not automatically mean you have a water-quality problem. It may, however, tell you that change is needed to avoid potential problems. In the same way, answering *NO* to every question does not mean you are *not* at risk.

Why should you care?

Groundwater is the underground water that supplies wells and springs and recharges surface water bodies. It is the source of drinking water for many Tennesseans. Up to 20 million gallons of groundwater may be stored under the typical farmstead—stored within 100 feet below fertilizer and pesticide storage areas, fuel tanks, livestock pens, and septic systems, all potentially major sources of pollution. The management decisions you make on your farmstead can significantly affect the quality of your drinking water and your family’s health. These decisions can also affect your potential legal liability and the value of your property.

Surface water includes bodies such as ponds, lakes, rivers, and streams. Besides their aesthetic and recreational value, they are often an important source of drinking water for livestock.

If stored safely, pesticides pose little danger to surface or groundwater. Occasionally, low levels of pesticides have been detected in wells, but 99.9% have been below the maximum contaminant level (MCL) set by the U.S. Environmental Protection Agency. However, if pesticides are not handled carefully around the farmstead, they can seep through the ground after a spill and contaminate surface or groundwater, or they

can enter a well directly during mixing and loading.

Pesticides are toxic to humans. If pesticides enter a water supply in large quantities after an accident, **acute** health effects (symptoms that appear after only a short period of exposure) can range from slight to severe. These effects include chemical burns, nausea, vomiting, and convulsions.

Usually, however, pesticides are found only in trace levels in drinking water. This still may pose a threat to humans and livestock through **chronic exposure** (prolonged or repeated exposure to low doses of toxic substances), which can cause minor or serious health problems later on.

Taking voluntary action to prevent pesticide contamination of groundwater will help to ensure that pesticides remain available for farmers’ use.

Water quality is least likely to be affected by pesticide use if you use as many low-risk practices as you can.

Farm•A•Syst is only for your own use and benefit. It is a voluntary program intended to provide general information about protecting and improving water quality. Information from a *Farm•A•Syst* assessment will not be collected by Extension or any other outside agency and should remain in your private records.

What you should know about . . .

1. Storage amounts

The more pesticides you store, the greater your

chances of a spill or leak. The more spills or leaks you have, the greater the chance of contaminating surface or groundwater.

Buy only what you need to use. Keep records of past field application rates and their effectiveness in order to make better purchasing decisions. Also, specific information for each container such as the manufacturer's name and address, the chemical type, and the label precautions are important to keep in case you must respond quickly to an accident.

A copy of this information should be kept separate from the storage area. If an accident does occur, you may not be able to enter the facility, or the container labels may be damaged or destroyed.

2. Leachability

Leachability is the tendency of a pesticide to move *with water* down through the soil. The higher the leachability of a pesticide, the more likely it is to percolate to groundwater in the event of a spill or leak.

If you store highly leachable pesticides, extra care must be taken to prevent accidents.

3. Formulations and spill cleanup

Formulation means the physical form in which a pesticide is packaged. Most formulations, ranging from liquid concentrates to soluble powders, are designed to be mixed with water.

Dry pesticides are more easily cleaned up after an accident than liquid pesticides. In the event of a dry spill, sweep up the pesticide and reuse it as intended. Dry pesticides should always be stored above liquid pesticides to avoid wetting from spills.

If a liquid pesticide spills, recover as much as possible and reuse it as intended. It may be necessary to remove some contaminated soil and apply it in the field. Remove the spilled liquid and contaminated soil no matter what the quantity, and dispose of them according to recommendations you receive when you report the spill to the Tennessee Emergency Management Agency at (800)262-3300.

4. Storage area

The construction and management of your pesticide storage facility is one of the most important considerations in protecting yourself against accidents. A facility with a gravel or dirt floor which permits spilled pesticides to soak into the soil poses a high risk to water quality.

An **impermeable** (waterproof) floor, such as concrete, virtually eliminates any seepage of chemicals into the ground. A curb around the floor catches spills before they spread. Ideally, you should install a secondary containment floor (made of an easily cleaned material like sealed cement or glazed ceramic tile) around the storage building. This prevents chemicals from reaching the ground if a bulk liquid-pesticide storage tank should leak. The finished soil grade should be three inches below the floor and sloped to provide surface drainage away from the building. The subsoil should have as low a permeability as possible.

How you store pesticides in your facility is also important. Keep different types of pesticides (herbicides, insecticides, and fungicides) separate to prevent cross-contamination. Plastic or metal pallets should be used to keep large drums or bags off the floor. Shelves for small containers should have a lip to keep the containers from sliding off.

Finally, pesticides pose a special threat if a fire should break out in the storage facility. The outside of the building should be labeled to let firefighters know it contains pesticides. Also, if containers are damaged in the fire, the chemicals can be carried away by water and spread over a large area. Consider where the run-off water would go in such a situation (for example, would it flow toward your well?) and determine whether a containment curb or other diversion is necessary.

5. Container condition

Sound containers are the first and most obvious defense against spills or leaks. Pesticide containers should be clearly labeled so that if an accident occurs, the necessary information is at hand. Also, the containers should have no holes, tears, or weak seams which make leaks likely.

Proper labeling of containers also keeps your inventory management effective. Use older products first, and check with your county Extension agent before using chemicals that have been stored a few years. New restrictions may have been applied to their use.

6. Accessibility to theft or damage

The prevention of unauthorized use of pesticides reduces the chances of theft or accidental spills. A locked storage cabinet or building intended only for pesticide storage and located away from other activities provides the best protection. However, you must allow road access for deliveries and emergency equip-

ment. For more information, consult the pesticide-applicator core manual, *Applying Pesticides Correctly: A Guide for Private and Commercial Applicators*.

7. Mixing/loading-area construction

Small quantities of pesticides spilled regularly in the same place can cause chemicals to build up in the soil and eventually reach groundwater. This is why an impermeable mixing/loading pad is so important. A pad provides spill protection during the transfer of pesticides to spraying equipment or nurse tanks.

The pad should be large enough to contain leaks from bulk tanks, washwater from cleaning equipment, and spills from transferring chemicals to the sprayer or spreader. Ideally, it should be equipped with a curb and a **sump** (drainage pit) for collection of spills and transfer to storage.

Locate the pad as close to the storage area as possible to minimize the distance that pesticides are carried.

If you don't have an impermeable mixing/loading pad, avoid mixing and loading near your well or on gravel driveways or other surfaces where spills can sink quickly into the soil. (A clay surface is better than sand.) The mixing site should be moved each year to prevent the buildup of chemicals in the soil.

8. Distance from well

If your mixing/loading area is permeable and therefore allows chemicals to seep into the soil, it should be located downslope from the well if at all possible. Ideally, the pad should be no less than 100 feet from the well. However, if your mixing/loading area is within ten feet downslope from the well or within 100 feet upslope from the well, the risk of contamination is high.

If runoff from your mixing/loading area threatens your well, construct a diversion to direct the water to another area.

9. Backflow contamination

Backflow is the reverse flow of a liquid caused by the sudden creation of a vacuum, much like sucking water through a straw. If a well pump shuts off while you are filling a pesticide sprayer, and the end of the hose is submerged in the pesticide mixture, backflow can suck the mixture backward through the hose into your well.

This can be prevented by the use of an anti-backflow device on the well. If you do not have one of these installed, be sure to maintain a six-inch air gap between the end of the hose and the top of the sprayer tank.

10. Supervision of sprayer filling

If you leave the sprayer unsupervised while it is being filled, you increase the likelihood of accidents. Spills can be caused by overfilling. Backflow contamination can occur if an air gap is not maintained between the hose and the pesticide mixture. Children or animals can wander into the filling area. Always remain onsite while the sprayer is being filled.

For restricted-use pesticides, a trained and certified applicator must supervise operations.

11. Method of transfer

Pouring pesticide products by hand always presents some risk of contact with the chemical or of spilling, especially if your sprayer's fill port is hard to reach.

Consider using a closed handling system, which transfers the pesticide directly from the storage container to the application equipment (through a hose, for example).

12. Sprayer cleanup and rinsate disposal

The sprayer should be rinsed out in the field, where the risk of contaminating your well with **rinsate** (rinse water) is slight. Use the rinsate for mixing the next load. Spray the last rinsate load on the appropriate crop.

13. Container disposal

The improper disposal of containers can result in contamination of the soil and of surface or groundwater. If you dispose of partially filled containers, for example, significant amounts of pesticides can leak into the soil.

When possible, use returnable containers or minibulks and take them back to the dealer when you are finished. Pressure-rinse or triple-rinse plastic containers immediately after use, since residue can be difficult to remove after it dries. Pour rinse water into the spray tank. Puncture containers and store them in a covered barrel until you can take them to a permitted landfill. Recycle plastic and metal containers whenever possible.

Empty bags completely when mixing, bind or wrap them to minimize dust, and take them to a permitted landfill. Never bury or burn pesticide containers or bags on the farm.

Remember:

- Buy only what you need. Keep records of what you have on hand, complete with the name and amount of each chemical, and use older products first.
- If possible, store pesticides in a facility designed just for that purpose.
- Never store pesticides inside a wellhouse or a facility containing an abandoned well.
- Your storage site should be downslope and at least 100 feet away from your well, or even farther away if your farm has sandy soils.
- The floor should be impermeable, and should have a curb if possible. If you plan to store large bulk tanks, provide a containment area with a sump large enough to confine 125 percent of the contents of the largest bulk containers, plus the volume of the rest of the containers.
- Be prepared for an emergency such as a fire. Label the windows and doors of your pesticide storage area, and provide adequate road access for emergency vehicles and equipment. Keep a list of the stored chemicals in a place separate from the storage area. Know whom to call for help if an emergency arises.
- Keep bags or drums off the floor and out of harm's way. Storage shelves should have a lip to keep containers from sliding off.
- Containers should be sound and clearly labeled.
- Keep different types of pesticides separate to prevent cross-contamination.
- Store dry products above wet ones.
- Keep your facility locked.
- Construct an impermeable mixing/loading pad as close to your storage area as possible.

- Keep several separate rinsate tanks so that you can use the rinsate from different chemicals as mixing water on later loads.
- Make sure that any runoff from your mixing/loading area will not reach your well. Don't mix and load pesticides near your well or on a gravel surface which allows spills to sink quickly into the ground.
- Install backflow-prevention devices on your faucets.
- Clean up spills immediately. If a spill reaches the soil, no matter what the quantity, report it to TEMA at (800)262-3300.
- Dispose of empty containers properly. Triple-rinse or pressure-rinse, save the rinsate for later use, and recycle when possible.

If you want more information . . .

Contact:

- Your county Extension office
- EPA National Pesticide Telecommunication Network (general information, 24 hours a day, year-round) (800)858-PEST (7378)
- EPA Safe Drinking-Water Hotline (general information, M-F, 8:30 a.m.-5:00 p.m.) (800)426-4791
- Chemical Referral Center (sponsored by the Chemical Manufacturers' Association; non-emergency situations) (800)CMA-8200
- Tennessee Emergency Management Agency (TEMA) (800)262-3300
- Tennessee Department of Agriculture (TDA) Division of Plant Industries (615)360-0130

- Tennessee Department of Environment and Conservation (TDEC)
Division of Water Pollution Control
401 Church Street
L&C Tower, 6th Floor
Nashville, TN 37243-1534
(615)532-0625
- TDEC Hazardous Waste Management Field Offices:
(disposal of soil contaminated by a spill)
Memphis (901)529-6695
Jackson (901)424-9200
Nashville (615)741-0654
Cookeville (615)423-4015
Chattanooga (423)634-5745
Knoxville (423)594-6466
Johnson City (423)928-6487
- Your pesticide dealer

Read:

- Factors Affecting Pesticide Movement to Groundwater and Good Management.* PB 1353.
Pesticide Use and Groundwater Protection. PB 1352.
Pesticides: Surface Runoff, Leaching and Exposure Concerns. University of Minnesota Bulletin AGBU-3911, 1990.
Pesticides and Groundwater: A Health Concern for the Midwest. Freshwater Foundation, 1986.
Pesticides: Health Effects in Drinking Water. Cornell Cooperative Extension, 1985.
Health Advisory Summaries. U.S. Environmental Protection Agency, 1989.
Applying Pesticides Correctly: A Guide for Private and Commercial Applicators. PB 1109.
A Consumer's Guide to Safer Pesticide Use. U.S. Environmental Protection Agency, 1987.
Chemicals in Your Community: A Guide to Emergency Planning and Right-to-Know Act. U.S. Environmental Protection Agency, 1988.
Citizen's Guide to Pesticides. U.S. Environmental Protection Agency, 1989.

These publications are available from your University of Tennessee Agricultural Extension Service county office.

Download:

These sites on the World Wide Web (WWW) are good places to start when browsing the Internet for information about water quality:

- <http://funnelweb.utcc.utk.edu/~utext>
(University of Tennessee Agricultural Extension Service)
- <http://www.epa.gov>
(U.S. Environmental Protection Agency)
- <http://www.usda.gov>
(U.S. Department of Agriculture)
- <http://h2o.usgs.gov>
(U.S. Geological Survey)
- <http://www.dtnsh.er.usgs.gov>
(Tennessee division of USGS)
- <http://hermes.ecn.purdue.edu:8001/server/water/water.html>
(National Extension Water Quality Database Website, Purdue University)

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Pesticide Leachability Chart

The pesticides listed on this chart are identified by **brand name**, **common name**, and **rating for movement by leaching (low, medium, or high)**. Identify the pesticides stored on your farmstead from the listing below. Note the leachability factor for each pesticide you store.

HERBICIDES

<u>Brand Name</u>	<u>Common Name</u>	<u>Rating</u>
Alanap	naptalam	-
Ally	metsulfuronmethyl	-
Amiben	chloramben	-
Amitrol T	amitrole	Med
Antor	diethatyl-ethyl	Low
Arsenal	imazapyr acid	High
Arsenal	imazapyr amine	High
Assert	imazethabenz	High
Assure	quizalofop-ethyl	Low*
Atrazine	atrazine	High
Avenge	difenzoquat	Low
Balan	benefin	Low
Banvel	dicamba	High
Basagran	bentazon	High
Betamix	phenmedipham & desmedipham	Low
Betamix	phenmedipham & desmedipham	Low
Betanex	desmedipham	Low
Bicep	metolachlor & atrazine	Med High
Bladex	cyanazine	Med
Blazer	acifluorfen	Med
Bronate	bromoxynil & MCPA ester	Low Low
Bronco	glyphosate & alachlor	Low Med
Buckle	trallate & trifluralin	Low Low
Buctril	bromoxynil	Low
Buxtril-	bromoxynil & atrazine	Low High
Butyrac 200	2,4-DB amine	Med*
Butyrac	2,4-DB ester	Low*
Cannon	alachlor & trifluralin	Med Low
Carbyne	barban	-
Casoron	dichlobenil	High

HERBICIDES, Cont'd

<u>Brand Name</u>	<u>Common Name</u>	<u>Rating</u>
Classic	chlorimuron	-
Cobra	lactofen	-
Command	clomazone	Med
Commence	trifluralin & clomazone	Low Med
Crossbow	trifluralin & 2,4-D ester	Low Low*
Curtail	clopyralid & 2,4-D amine	High Med
Curtail M	clopyralid & MCPA ester	High Low
Dacthal	DCPA	Low
Dowpon	dalapon	High
Dual	metolachlor	Med
Eptam	EPTC	Med
Eradicane	EPTC	Med
Eradicane Extra	EPTC	Med
Evik	ametryn	Med
Extrazine II	atrazine & cyanazine	High Med
Far-Go	trallate	Low
Fusilade 2000	fluazifop	Low
Galaxie	bentazone & acifluorfen	High Med
Genate Plus	butylate	Med
Genep	EPTC	Med
Glean	chlorsulfuron	-
Goal	oxyfluorfen	Low*
Gramoxone Extra	paraquat	Low
Harmony	DPX-M6316 & Extra DPX-L5300	- -
Herbicide 273	endothall	Low
Hoelon	diclofop	Low
Kerb	pronamide	Low
Krenite	fosamine	Low

HERBICIDES Cont'd

<u>Brand Name</u>	<u>Common Name</u>	<u>Rating</u>
Laddock	atrazine & bentazon	High
Lariat	alachlor & atrazine	Med High
Lasso EC	alachlor	Med
Lasso Micro Tech	alachlor	-
Lasso II	alachlor	Med
Lasso-Atrazine	alachlor & atrazine	Med High
Lexone	metribuzin	High
Lorox	linuron	Med
Lorox Plus	linuron & chlorimuron	Med -
Marksman	dicamba & atrazine	High High
MCPA Amine	MCPA amine	-
MCPA Ester	MCPA ester	Low
Nortron	ethofumesate	High
Option	fenoxaprop	Low
Pinnacle	DPX-M6316	-
Poast	sethoxydim	-
Pramitol	prometon	High
Preview	metribuzin & chlorimuron	High -
Princep	simazine	High
Prowl	pendimethalin	Low
Prozine	pendimethalin & atrazine	Low High
Pursuit	imazethapyr	-
Pursuit Plus	imazethapyr & pendimethalin	- Low
Pyramin	pyrazon	High
Ramron	propachlor	Low
Ramrod-Atrazine	propachlor & atrazine	Low High
Ranger	glyphosate	Low
Reflex	formesafen	High
Rescue	naptalam & 2,4-DB	- Med*
Rhino	butylate & atrazine	Med High
Or-Neet	cycloate	Med
Roundup	glyphosate	Low
Salute	metribuzin & trifluralin	High Low
Scepter	imazaquin	-
Sencor	metribuzin	High
Sinbar	terbacil	High
Sonalan	ethalfluralin	Low

HERBICIDES Cont'd

<u>Brand Name</u>	<u>Common Name</u>	<u>Rating</u>
Spike	tebuthiuron	High
Stampede	propanil & MCPA ester	Low Low
Stinger	clopyralid	High
Storm	bentazon & acifluorfen	High Med
Surflan	oryzalin	Low
Sutan+	butylate	Med
Sutazine+	butylate & atrazine	Med High
2,4-D Amine	2,4-D amine	Med
2,4-D Ester	2,4-D ester	Low*
Tandem	tridiphane	Low
Thistrol	MCPB	-
Tillam	pebulate	Med
Tordon	picloram	High
Treflan	trifluralin	Low
Turbo	metolachlor & metribuzin	Med High
Velpar	hexazinone	High
Vernam	vernolate	Low
Weedar	MCPA amine	-
Weedmaster	dicamba & 2,4-D amine	High Med
Weedone 2,4-DP	dichlorpropesate	Low*
Whip	fenoxaprop	Low

INSECTICIDES

<u>Brand Name</u>	<u>Common Name</u>	<u>Rating</u>
Ambush	permithrin	Low
Aqua 8-Parathion	parathion	Low
Asana XL	esfenvalerate	Low
Bolstar	sulprofos	Low
Broot	trimethacarb	LowII
Carzol	formetanate	Low
Counter	terbufos	Low
Cygon	dimethoate	Med
Cythion	malathion	Low
Diazinon	diazinon	Med*
Dimilin	diflubenzuron	Low
DiSyston	disulfoton	Low
Dyfonate	fonofos	Med
Dyfonate II	fonofos	Med
Dylox	trichlorfon	High
Endocide	endosufon	Low
Endocide Plus	endosulfon & parathion	High Low*
Force	tefluthrin	-

INSECTICIDES Cont'd

<u>Brand Name</u>	<u>Common Name</u>	<u>Rating</u>
Furadan	carbofuran	High
Guthion	azinphos-methyl	Low
Imidan	phosmet	Low
Knox-Out	diazinon	Med*
Lannate	methomyl	High
Larvadex	cyromazine	High*
Larvin	thiodicarb	Low
Lindane	lindane	Med
Lorsban	chlorpyrifos	Low
Malathion	malathion	Low
Malathion/ methoxychlor	malathion & methoxychlor	-
Mavrik	fluvalinate	Low
Metasystox-R	demeton-s-methyl	High**
Methoxychlor	methoxychlor	-
Mitac	amitraz	Low**
Mocap	ethoprop	High
Monitor	methamidophos	High
Nudrin	methomyl	High
Orthene	acephate	Low
Parathion	parathion	Low*
Pennacap-M	methyl parathion	Low
Phosdrin	mevinphos	Med
Phoskil	parathion	Low*
Pounce	permethrin	Low
Pydrin	fenvalerate	Low
Rampart	phorate	Low
Scout-Xtra	tralomethrin	-
Sevin	carbaryl	Low
Somanil	methidathion	Med
Supracide	methidathion	Med
Swat	phosphamidon	-
Temik	aldicarb	High
Thimet	phorate	Low
Thiodan	endosulfan	Low
Trigard	cyromazine	High*
Vydate	oxamyl	Low

FUNGICIDES

<u>Brand Name</u>	<u>Common Name</u>	<u>Rating</u>
Agsco TN-IV	tin	-
Agsco MN F	maneb & zinc	Low**
Bayleton	triadimefon	Med
Benlate	benomyl	High
Blitex	maneb & triphenyl tin	Low**
Botran	dicloran	Low**

FUNGICIDES

<u>Brand Name</u>	<u>Common Name</u>	<u>Rating</u>
Bravo	chlorothalonil	Low
Captan	captan	Low
Carbamate	ferbam	Med
Champion	copper-fixed	-
Crotothane	dinocap	Low**
Cyprex dodine	acetate	Low**
Daconil	chlorothalonil	Low
Dithane	mancozeb	Low
Duter	tin	-
Dyrene	anilazine	Low
Karathane	dinocap	Low**
Kelthane	dicofol	Low**
Kocide	copper hydroxide	-
Magnetic 6	sulfur	-
Maneb	maneb	Low**
Maneb & Zinc	maneb & zinc	Low**
Manzate	mancozeb	Low
Merteck	thiabendazole	-
Orbit	propiconazole	Med**
Penncozeb	mancozeb	Low
Polyram	metiram	Low**
Protex	maneb triphenyl tin	Low** -
Ridomil	metalaxyl	High
Ronilan	vinclozalin	Low**
Rovral	iprodione	Low*
Rubigan	fenarimol	High
Super Six	sulfur	-
Super Tin	tin	-
Telone II	dichloropropene	Med
Terrachlor	PCNB	Low*
Tersan	benomyl	High
That F	sulfur	-
Thiolux	sulfur	-
Tilt	propiconazole	Med**
Top Cop	basic copper sulfate	-
Topsin	thiophanate methyl	Low**
Triphenyl Tin Hydroxide	triphenyltin hydroxide	- -
Triple Tin	triphenyltin hydroxide	- -
Vitavax	carboxin	Low
vorlex	dichloropropene & methyl- isothiocyanate	Med Med

* The rating is an estimate, but reasonably accurate compared to estimated ratings footnoted**.

** The rating is a guess, and subject to a higher degree of error than estimates footnoted*.

Adapted from Becker, R.L., et al. 1990, **Pesticides: Surface Runoff, Leaching, and Exposure Concerns**. Minnesota Extension Service. Data were derived from U.S. Dept. of Agriculture SCS/ ARS Pesticides Properties DATA Base, Version 1.9, August 1989, developed by R.D. Wauchope et al., and ratings derived by D.W. Goss.

Chart modified annually. Contact your Soil Conservation District office or Extension office for the most recent version.



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Notes



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The University of Tennessee Institute of Agriculture, U.S. Department of Agriculture,
and county governments cooperating in furtherance of Acts of May 8 and June 30, 1914.

Agricultural Extension Service

Billy G. Hicks, Dean